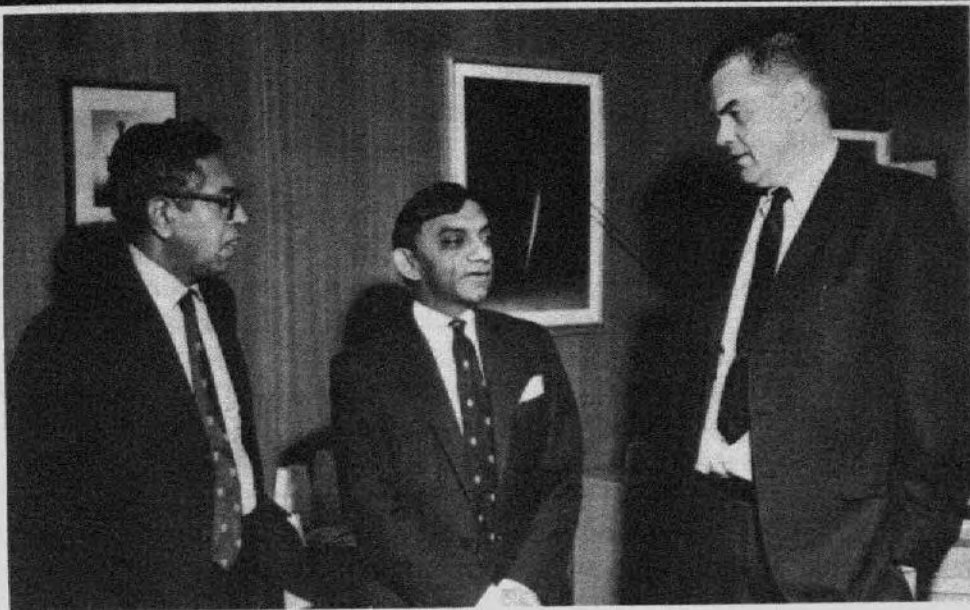


# the astrogram

VOLUME XIII  
NUMBER 4  
December 10, 1970

National Aeronautics and Space Administration • Ames Research Center, Moffett Field, California



Dr. Hans Mark (right), Ames Director, greets the newly appointed Ambassador from Ceylon, Neville Kanakarathne (center), on the occasion of his first visit to the Ames Center. Dr. Cyril Ponnampereuma, Ames scientist, who announced the finding of amino acids in a meteorite looks on.

## Ames Team Makes Amino Acid Find

The first positive identification of amino acids of extraterrestrial (non-earthly) origin has been made by scientists at Ames. The find, according to Dr. Cyril A. Ponnampereuma, is probably the first conclusive proof of extraterrestrial chemical evolution, the chemical processes which precede the origin of life.

A team of five members of the Chemical Evolution Branch worked with Dr. Ponnampereuma on the findings. Dr. Keith Kvenvolden, Dr. James Lawless, Etta Peterson, and Jose Flores were responsible for the identification of the Amino Acids, Katherine Pering was responsible for the identification of the hydrocarbon.

The amino acids, among the principal constituents of living cells, were found in abundance in a meteorite which fell near Murchison, Victoria, Australia, on September 28, 1969. The discovery was confirmed by a battery of laboratory tests, and is reported in the current edition of NATURE.

The work was done on material taken from a meteorite identified as a class II carbonaceous chondrite whose impact near Murchison was observed. Scientists believe that this type of meteorite originates in the asteroid belt.

The find has three major aspects, according to Dr. Ponnampereuma. It is strong new evi-

dence for the theory of chemical evolution. It suggests the possible existence of life elsewhere in the universe -- resulting from chemical evolution. It may provide a new time sequence for the origin of life on Earth and elsewhere in the universe.

The find was made by a team of Ames researchers, headed by Dr. Ponnampereuma. Important parts of the work also were done by Drs. Ian R. Kaplan, UCLA; and Carleton Moore, Director of the Center for Meteorite Studies, Arizona State University.

The theory of chemical evolution states that, starting with the basic elements of the primordial universe, various types of energy discharges caused ever-more-complex chemical molecules to evolve. After hundreds of millions of years of chemical evolution, very complex molecules appeared which could reproduce themselves, and thus could be considered the first forms of life.

Amino acids are basic constituents of living cells. However, the amino acids found in the Murchison meteorite do not appear to be of biological origin. Neither do other complex organic molecules (various hydrocarbons) also found in the meteorite.

The discovery of these non-biological amino acids in the meteorite shows: (continued on page 3)

## Apollo 14 Nears Jan. 31 Launch

The Apollo 14 crews; Commander Alan Shepard, Command Module Pilot Stuart Roosa and Lunar Pilot Edgar Mitchell and backup Commander Eugene Cernan, Command Module Pilot Ron Evans and Lunar Module Pilot Joe Engle are nearing the end of their training for the Apollo 14 mission, scheduled for January 31.

During their exploration of the lunar hill country in February, Shepard and Mitchell will set off 21 small explosions on the surface and arm a mortar to launch four grenades after they leave. This will be the first time this series of experiments have been attempted.

Measurements of the resulting vibrations of the Moon, radioed to Earth, will give scientists new information on the shape, structure and thickness of the outer lunar crust.

The Active Seismic Experiment, as it is called, will be set out by Mitchell during the first of two four-to-five hour ventures outside the LM with Shepard during their day-and-a-half on the Moon.

While Shepard deploys other scientific instruments and gathers rocks, Mitchell will lay out 310 feet of cable and stick three vibration detectors, called geophones, into the lunar soil at intervals of 150 feet. As he then walks back

to a central recording and relay station, he will fire cartridges every 15 feet with a device called the "thumper."

The thumper is a tube about three and a half feet long with a hollow cylinder at the lower end. The upper section contains electronics for the firing mechanism and the cartridge barrel. In the cylinder is a plate that, when pressed against the Moon as a cartridge is fired, transmits the force of the explosion to the lunar surface. This creates seismic waves for detection by the geophones.

After firing the last of the cartridges, Mitchell will then set up and arm the boxlike, four-barrel mortar about 10 feet from the central station, aiming it away from the area where he and Shepard will be working later in their inspection of the landing site and sample-gathering expedition.

The mortar contains four high-explosive grenades that will be rocket-launched, on radio command from Earth, to detonate at ranges of 500 feet, 1,000 feet, 3,000 feet and 5,000 feet. The vibrations caused will also be picked up by the geophones, and their strength and speed through the Moon will provide additional information on its structure. Data will be obtained from as deep as 1,500 feet.



APOLLO 14 ASTRONAUTS . . . left to right, Edgar D. Mitchell, Alan B. Shepard, Jr. and Stuart A. Roosa posed for photographers at the Kennedy Space Center. Shepard and Mitchell are scheduled to explore the moon's Fra Mauro region while Roosa pilots the command module in lunar orbit. Launch is scheduled for January 31, 1971.





PETER J. HARO . . . left, of the Electronic Instrument Branch demonstrates the tool he devised to securely hold a BNC connector during mounting. Watching the demonstration is Richard E. Harmon, right, head of the Wind Tunnel Installation Section. The tool, for which Mr. Haro was awarded \$25 by the Ames Suggestion Committee, is an improvement over previous methods. The tool allows for tighter fit on the chassis, and better electrical contact.

## Italy to Launch U.S. Satellite

The first American satellite to be launched by another country will be placed in Earth orbit by a team of Italian space engineers operating from a mobile launch platform located in the Indian Ocean. The launch will take place off the coast of Kenya in East Africa no earlier than December 12.

The spacecraft is the Small Astronomy Satellite-A (SAS-A), 42 in the Explorer series. It is the first satellite equipped with sensitive experiments to detect high-energy X-ray sources in space, and is also known as the X-ray Explorer.

Successful operation of the astronomy satellite will allow scientists to take the next giant step in astronomy, the cataloging of powerful X-ray sources both within and outside our galaxy, the Milky Way. During the first day of operation of its scientific instruments, the satellite is expected to collect more data than has been obtained with sounding rockets in the eight years since the science of X-ray astronomy was born.

When correlated with radio and optical astronomy findings, this information will give astronomers a new dimension for understanding the mysteries of the high-energy phenomena of our galaxy and those which govern the principal physical pro-

## Time to Renew Your Bumper Pass?

Ames employees may have noticed a traffic jam at the NAS Moffett Field main gate recently. It was caused by employees who had not renewed their bumper pass on time. The Marine guards must stop any car with an expired bumper pass and scrape off the old pass.

This process is time-consuming, not only for the owner of the expired pass, but for the guards and all employees waiting to enter through the main gate as well. Employees are asked to check the expiration date of the bumper pass on their vehicles and to renew it before it expires, this will save time for all concerned.

Passes may be renewed anytime within a month before the expiration date at the Ames Badges, Decals, and Key Issue Office, Building 241, Room 119.

cesses of the universe.

The X-ray Explorer will be launched no earlier than 10 a.m. East African time (2 a.m. EST). SCOUT BOOST

A four-stage, solid-propellant Scout launch vehicle will boost the 315-pound (142.8 kilogram) Explorer satellite into a circular orbit along the equator, some 342 statute miles (550 kilometers) high. The spacecraft will circle the globe once about every hour and a half and has a design lifetime of six months.

## Summer Research Program at Ames

The National Science Foundation has announced the funding of the second consecutive Stanford University-Ames High School Teacher Summer Research Program. Thirty high school science teachers will be selected to participate in the nine-week program.

The program is conducted jointly by Ames and Stanford University. The teachers will attend accredited courses at the University, while conducting research with Ames scientists. A Space Biology course will be taught jointly by the Stanford Biology Department and the Ames Life Science Directorate.

The program, originated by Dr. Ponnampuruma, Chief of the Chemical Evolution Branch, attracted the interest, last summer, of the NASA Educational Programs director. It was thought to have possible future applications, elsewhere.

Twenty-eight science teachers came to Ames last summer, from all parts of the United States to participate in the program. The teachers conducted independent investigations of some aspect of space biology, in addition to a jointly developed blueprint for basic experiments in space biology which could be carried out by high school students.

## Health Premium and Taxes Reduced

A provision of the Tax Reform Act of 1969, Public Law 91-172, will reflect a decrease in income tax withheld from wages effective with the pay period beginning December 27, 1970. The tax rate change is due to an increased standard deduction from \$1000 or 10 percent of adjusted gross income to \$1500 or 13 percent of adjusted gross income, whichever is less. In addition, tax rates for single persons or persons using "head of household" will be lower. The standard exemption of \$650 effective July 1, 1970, will remain in effect until 1972. The reduced withholding tax

	PRESENT		NEW	
	Employee	Agency	Employee	Agency
<b>BLUE CROSS</b>				
Self Only - High	\$ 5.57	\$1.68	\$ 5.60	\$ 3.46
Family - High	13.59	4.10	13.47	8.64
Self Only - Low	2.16	1.68	2.40	2.40
Family - Low	5.30	4.10	5.88	5.88
<b>AETNA INS. CO.</b>				
Self Only - High	6.68	1.68	6.33	3.46
Family - High	16.64	4.10	15.62	8.64
Self Only - Low	2.89	1.68	2.68	2.68
Family - Low	6.84	4.10	6.40	6.40
<b>KAISER PLAN</b>				
Self Only - High	5.28	1.68	4.29	3.46
Family - High	14.11	4.10	11.54	8.64

## Use Gate 18 Sat.

Your help is needed December 12 to avoid traffic congestion caused by the Ames Annual Christmas Party.

All employees entering the field for the party on Saturday are asked to please use Gate 18. Gate 18 will be open that day, specifically for the Christmas party, from 9:30 a.m. to 4 p.m. Each vehicle must have a bumper pass, and at least one occupant with a NASA identification badge.

Anyone attempting to enter through the Main Gate will be directed to Gate 18, unless each passenger in the vehicle has a NASA identification badge.

## Vacancy Notice

Supervisory Aerospace Engineer GS -861-13/15, Computational Fluid Dynamics Branch (Assistant Chief) Closing date, December 15, 1970. AST, Theoretical Simulation Techniques GS-1301.1-13/14/15 Computational Fluid Dynamics Branch (Computer Operations Administrative Assistant)

Closing date December 16, 1970. AREA OF CONSIDERATION: Directorate of Astronautics. Call the Employment Branch, ext. 2021, before closing dates.

## Taxes Reduced

will be reflected in the pay checks scheduled to be issued on January 15, 1971.

Effective with the pay period beginning January 10, 1971, most employees will pay less for their health premium rates. Public Law 91-418 approved September 25, 1970, increases the Government share of the total health premium from 24 percent to 40 percent. Although most their health premium rates, the increase has been offset by the increased Government share. The new health premiums will be reflected in the pay checks scheduled to be issued on January 29, 1971.



## Ames Team Amino Acid Find

(Continued  
from page 1)

• That building blocks of life such as amino acids can form by chemical means in nature.

• That these complex molecules can form away from the Earth, in other parts of the solar system, and presumably elsewhere in the universe.

That the discovery appears to set a time sequence.

Scientists believe that the planets of the solar system, including the Earth, formed 4.5 billion years ago from an interstellar gas cloud. The Murchison, like virtually all other meteorites, is believed to be 4.5 billion years old.

Finding of amino acids and other complex organic molecules in the Murchison meteorite strongly suggests that these complex life materials have been present from the time of formation of the Earth.

The Ames discovery is not the first report of amino acids and hydrocarbons in meteorites. But other reports have been seriously criticized because of the fact that biological materials may have gotten into the meteorites after their impact with Earth.

Although earthly contamination of the Murchison meteorite cannot be rigorously ruled out, its case differs because of a number of proofs of non-biological and non-earthly origin resulting from the precise identifications made in the Ames work.

The researchers found five of the twenty amino acids normally found in living cells. Along with them, they found 11 other amino acids in good quantity -- compounds, structurally

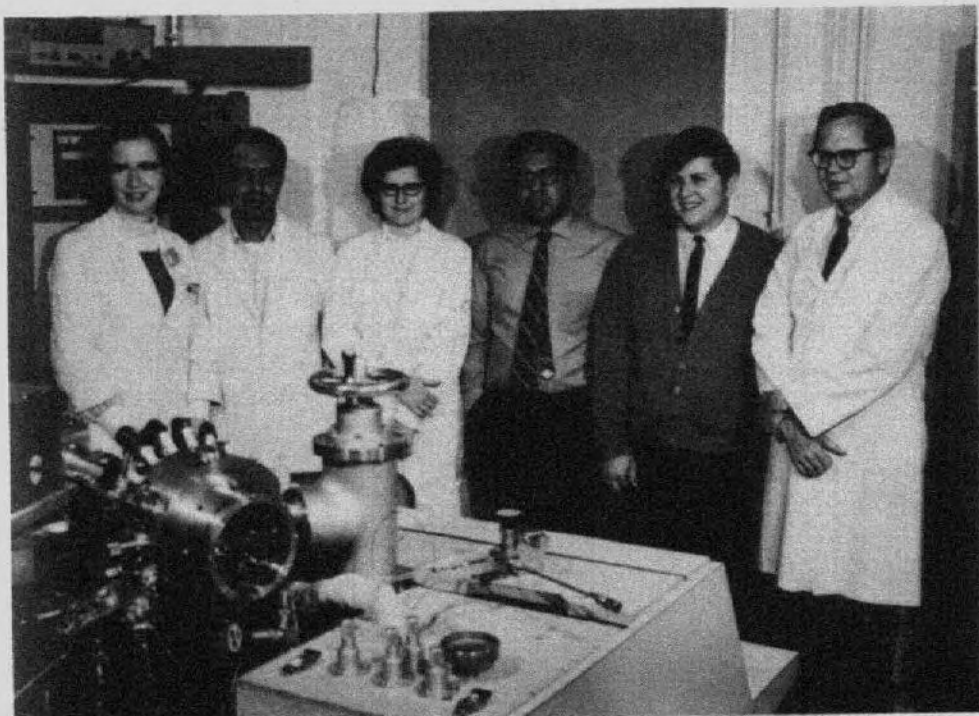
almost identical to the protein-forming amino acids but having no functional role in living organisms.

The amino acids found were of both D and L types (right and left handed molecule structures). Amino acids of biological origin, like those found on earth, are all of the left-handed variety. Biologists can imagine that life on another planet could be based on right handed amino acids instead. But they agree that a mixture of both types virtually rules out biological origin, and certainly earthly origin. "Right handed" amino acids are very rarely found on Earth because earth organisms produce only left-handed amino acids.

Still more evidence for non-biological and non-earthly origin is that biological-type hydrocarbons also were found mixed with non-biological hydrocarbons. These were in proportions similar to those found in Dr. Ponnampuruma's experiments at Ames which simulate the process of chemical evolution in the laboratory.

Finally, a far higher proportion of the heavy isotope carbon 13 was found than would have been found in earthly biological material. Earth organisms contain relatively little carbon 13 due to fractionation during photosynthesis.

The identification of the materials in the Murchison meteorite was made by gas chromatography combined with mass spectrometry, among the most precise methods known for exact identifications of complex chemicals.



THE AMES TEAM . . . which has recently attracted world-wide interest for their work on the extraterrestrial Amino Acid find, is pictured in one of the laboratories they used for their work. Members of the Chemical Evolution Branch, they are, left to right, Etta Peterson, Jose Flores, Katherine Pering, Dr. Cyril Ponnampuruma, Dr. James Lawless and Dr. Keith Kvenvolden.

## Addresses of Recent Retirees

In recent weeks there have been several inquiries from Ames retirees asking about employees at the Center who may have joined their carefree ranks during the past months.

As a result, we are publishing a list of those employees who have retired recently, and the forwarding address for each. We hope this will bring many old friends together who may have lost touch in the past few years.

Malcom P. Albares  
35 Clayton Ave.  
San Jose, Calif. 95110

John O. Howe  
16151 Jasmine Way  
Los Gatos, Calif. 95030

George E. Anstutz  
366 Spar Ave.  
San Jose, Calif. 95117

Vernon E. Hughes  
4401 Moran Drive  
San Jose, Calif. 95129

Robert T. Armstrong  
751 South 12th St.  
San Jose, Calif. 95112

John W. Irwin  
P.O. Box 605  
Saratoga, Calif. 95070

Isaac C. Baughman  
4013 Moreland Way  
San Jose, Calif. 95130

Arthur G. Kaskey  
1519 Brandywine Rd.  
San Mateo, Calif. 94402

John A. Britton  
10010 Carmen Rd.  
Cupertino, Calif. 94015

Raymond H. Matthew  
4081 Amaranta Avenue  
Palo Alto, Calif. 94306

Michael Cabral  
572 Franklin St.  
Mt. View, Calif. 94040

Edna Meacham  
3523 Machado St.  
Santa Clara, Calif. 95051

J.K. Clementson  
3511 Earl Drive  
Santa Clara, Calif. 95051

Lloyd E. Mock  
10362 San Fernando  
Cupertino, Calif. 95014

Stewart M. Crandall  
Star Route, Box 331  
Pioneer, Calif. 95666

Charles E. Nagy  
24509 La Cuesta Dr.  
Los Altos, Calif. 94022

Leonard J. Fairfield  
1192 Brace Ave.  
San Jose, Calif. 95125

William H. Nelson  
10460 Baywood Dr.  
Cupertino, Calif. 95014

Chales M. Fitzmaurice  
2469 Walnut Grove Ave.  
San Jose, Calif. 94040

Jean Newell  
2046 Kent Dr.  
Los Altos, Calif. 94022

James & Susie Fitzgerald  
4095 El Cerrito Rd.  
Palo Alto, Calif. 94036

Russell G. Robinson  
10702 Mora Drive  
Los Altos, Calif. 94022

Frank F. FoHette, Jr.  
17970 Skyline Blvd.  
Los Gatos, Calif. 95030

Robert Sanchez  
518 Santa Ana Ave.  
San Jose, Calif. 95112

Angelo Frosolone  
1307 Ernestine Lane  
Mt. View, Calif. 94040

Elisha K. Stutznegger  
323 Staples Ave.  
San Jose, Calif. 95127  
Odes G. Walton  
10716 S. Stelling Rd.  
Cupertino, Calif. 95014

Franklyn B. Fuller  
44 Magnolia Lane  
Santa Clara, Calif. 95051

William D. Haney  
798 Aurora Ave.  
San Jose, Calif. 95129

Elmer H. Hopson  
1231 Lawrence Expressway  
Sunnyvale, Calif. 94086

**The Astrogram** Room 134  
Admin. Mgt. Building  
Phone 2385

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Editor . . . . . Dot Evans  
Reporters . . . . . NASA Employees

Deadline for contributions:  
Thursday between publication dates



## Ames Airings

... by Jeanne Richardson

AL HERTZOG (Procurement) and his wife Charlotte are certainly qualifying for membership in the "Jet Set." They returned recently from their second trip this year to Europe. Before you decide that Al has been doing a little extra procuring during his coffee breaks, you should know that Al's daughter is a stewardess for Pan Am, lucky Al.

Their last trip would make even a "Jet-Setter" jealous. They saw Paris, Rome, London and Istanbul. The Hertzogs were particularly charmed with the Eastern atmosphere of Istanbul.

Some of the special beauties of Istanbul were the 4000, plus, shopkeepers in the old bazaar section; of course, the jeweled and golden sultan's throne, valued at over \$50 million; and the exotic belly dancers.

Since the Hertzogs were staying in the old section of Istanbul, they didn't see a newspaper printed in English for two days. Consequently, they had no idea there was a cholera epidemic raging through Turkey just then. When they found out, they realized they were not immunized against cholera and had to cut their visit short. Despite the length of the stay, the Hertzogs loved Istanbul.

Lots of Ames people went up to the snow country last weekend, and had a great time. RALPH MAINES (Security) said it was some of the best ski conditions he had ever seen. DAVID RAITHEL (Contract) also went up with skis, and came back happy.

JAN KONRATH (Data Management Analysis) was visited by her parents, Henry and Jean Konrath, recently. The Konraths, from Chadron, Nebraska, had a pretty exciting trip. It was their first ride on a jet, and when they arrived, Jan and her two brothers took them on a grand tour of the Bay area. They visited Hearst Castle, Fisherman's Warf and took a leisurely cruise on San Francisco bay.

### CONGRATULATIONS

JIM CONNALLY (Research Instrumentation) and his wife Stephanie received an early Christmas present that is guaranteed to bring joy to any season; an eight pound two ounce baby boy. Thadeus Hugh was born December 3 and was 19 1/2 inches long.

The Ames Ski Club is having its first social function, Wednesday, December 23. It's a Christmas party for Ski Club members and all interested skiers. For information call ext. 2973.

## JOGGERNEWS

... by Jim Woodruff

Thanks to our mild climate, cross-country running is a year-around sport for the Ames Joggers, who find that wind and rain add welcome variety to their enjoyment of the out-of-doors.

On October 31, Vito D'Aloia tried the Golden Gate Park, 10 kilometer Run over rocks, sand, water and logs, and under tree branches, finishing the event in forty four minutes.

Vito and Paul Sebesta ran the Turkey Trot, a ten mile hill run in the East Bay, Paul finishing in nineteenth place and Vic in twenty-sixth place.

Five Joggers completed the Daly City Hill Run on November 21. This was a 6.7 mile run, half of it up an eleven hundred foot hill, and the other half back down again. The Joggers and their times: Bruce Castle, 44:50; Paul Sebesta, 45:15; and Vito D'Aloia, 47:35; Jerry Barrack, 48:36; and Jim Woodruff, 52:16.

Coming up are the Petaluma Marathon (a marathon race is 26 miles 385 yards) on Dec. 13, and the Los Altos Town Crier Midnight Run, a ten kilometer race that starts with the new year (midnight, New Year's Eve) at Foothill College.

## AMES ADVENTURERS

The Ames Adventurers Club with TWA is sponsoring a 15-day trip to Spain and Portugal. Package includes several towns in Spain and complete tour of Lisbon. Total cost including 2 meals per day, transportation, hotels, guides, baggage transfers, etc. is \$449 from Oakland. Many dates are available thru March 1971. Brochures may be obtained by calling Jan Konrath, ext. 2009. Upcoming for early March is a week-end train trip to Reno. Cost for train (with meal) and hotels is estimated to be \$48. More details will be available when trip is finalized.

## Ski Trip Offered

Ski Jackson Hole, Wyoming this season. Join a small group flying from San Francisco on January 16 and returning on January 23. The cost of all transportation, 7 nights lodging at the Alpenhof (located at the base of the Gondola in Teton Village), and 6 days of lift tickets is \$201 per person (three to a room) and \$219 per person (two to a room). For further information, contact Lou Polaski at (408) 738-1536.

## BOWLING

... by Dennis Riddle

Twelve weeks of the first half have been completed. In division I the Huffers are in first place, the Comets in second. In division II, first place belongs to the Eight Balls with the Crazy Eights and The Gotchas tied for second.

On December 1, some of the showoffs were Jerry Dickson 220/583, Cal Eddleman 561, Chuck DeRose 554, Howard Garrison 223, Max Wilkins 213, and Dean Jaynes 210.

A reminder to the All-Ames Bowlers: no bowling on December 22 and 29 due to the holidays. Merry Christmas and a Happy New Year to all.

## BASKETBALL

... by Phil Wilcox

The all Ames league got back into the swing of things after a 3 week layoff with their games on December 3. LSC retained their lead in the league by soundly defeating Madmen by a score of 50-20. The Fighting Pumas won their first game of the season by handing ARO their third lost. Score F.P. 33-ARO 19. The third game of the evening saw the Jets going against the Beer Barrels. The final score B.B. 46 - Jets 42.

### LEAGUE STANDINGS

CSC	WON	LOST
Madmen	2	1
Beer Barrels	2	1
Jets	1	2
Fighting Pumas	1	2
ARO	0	3

## Apollo 14 Covers

Manned Spacecraft Center Stamp Club has announced plans for issuing a set of spaceflight covers commemorating the Apollo 14 mission scheduled for launch on January 31, 1971.

The set of three covers will be postmarked on dates of launch, lunar landing, and splashdown, at Houston, Texas.

Each cover will bear the official inscription of the NASA Manned Spacecraft Center Stamp Club, and a four-color reproduction of the official mission insignia which shows the astronaut emblem streaking toward the moon from earth, and the names of the crew, Shepard, Roosa, and Mitchell.

Non-members may write to MSC Stamp Club, Box 58328, Houston, Texas 77058, enclosing \$1 for each set of three. A stamped self-addressed envelope must be furnished, and the request should be marked "Apollo 14 covers."

## WANT ADS

The Astrogram's ad section is provided as a personal, non-commercial service to Ames employees. Advertiser must be identified by name, extension and organization. The name may be left out of the ad but is needed for records. Ads must be submitted in writing to The Astrogram, N-241-4, by Thursday, a week before publication. The advertiser's home telephone number must be provided as a point of contact except in carpool notices.

### HOUSING

For Rent-Winterized cottage near Rte. 89 and N. Tahoe ski areas. Sleeps 6 - \$90/wk or \$40/wknd. call 328-4642.

### MISCELLANEOUS

For Sale-Naughahyde love seat, beige color, \$75 excellent condition, 739-6767.

Wanted-A home for retarded children needs discarded toys of all types. Call Howard Savage, 967-1443.

For Sale-Knight Amateur Communications Receiver, Model R-100A, Broadcast to 30 MHz, like new, \$65, 257-1784, D. Engelbert.

For Sale-Color organ, connects to any Hi-Fi system, like new, cost \$130, will take \$50. Nice for Christmas, call Don Goodsell, 968-1200.

For Sale-Stereo Amplifier, solid state, six months old, 15 watts, walnut case, \$40. Phone 253-6642.

For Sale-Westinghouse self-cleaning range, white 8 mo. use, \$295; G.E. built-in oven, aqua, \$95, matching range top \$45; infant wardrobe dresser \$15; rocking chair and stool, \$13, call 967-8086.

For Sale-Two 695-14 tires, used 4000 miles, good shape, \$5 each, call 867-2748.

For Sale-12 year old stereo hi-fi, record player (no tuner). Still works, sounds good, \$25. Nearly new 4 band portable radio, cost \$2, sell for \$20 call Doug Pearson 967-2970.

For Sale-1969 Honda Excellent condition, 175 cc. 20 h.p., can be driven on freeway, can be seen at 3186 Durant ave., asking \$375, or call 225-4065.

For Sale-Human hair wig, never worn, cost \$69.95 will sell for \$20. Ideal christmas gift. 253-4476.

Ride Wanted-vicinity of Blossom Valley Shopping Center, Mountain View, to Moffett Field, mornings, call Teri 967-7264, after 6 p.m.

For Sale -Boy's 26" Schwinn Bike, heavy duty, equipped for paper route, \$50, call Jeff at 245-0739.

For Sale or Lease-Quarter-type Buckskin gelding, 7 yrs., 15.2 hands. Has been shown English and Western. \$400 or make offer. Janis 349-4098.

For Sale-Girl's Sting Ray bicycle, good condition. Boy's Sting Ray bicycle, very good condition, call 274-5703 after 5 p.m.

Free Puppy-Very energetic, shaggy haired terrier, poodle, mixed breed, male, tan color with black tinge, 8 mos. old, has had distemper and rabies shots, tel. 739-8973.

For Sale-Dyna 50 w. high fidelity monaural amplifier, \$35, J. Keeler, 732-2870.

For Sale-Victor minibike, 4 hp, Tecumseh Eng. with alternator and jackshaft. Brakes both wheels, spring mounted forks and seat. Very good cond. \$135, Jim Meek, 356-0680.

For Sale-Chairs, stuffed \$50, French \$40, Turkish \$95 library table \$40, large leaded glass front buffet \$95, old trunk \$25, solid oak dresser \$30, 322-7612.

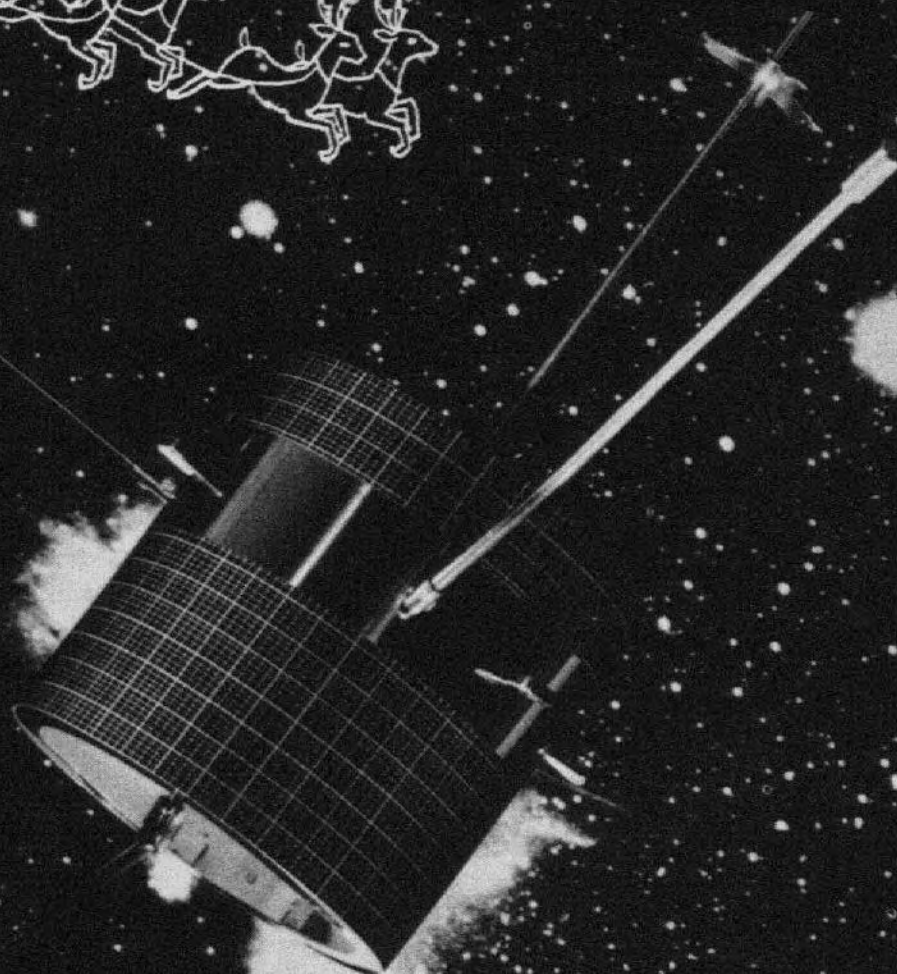
For Rent or Lease-Santa Clara, neat 3 bedroom, 2 bath, unfurnished home, 15 minutes to Ames carpets, drapes, washer, stove, fireplace, patio. 2-car garage. Walking distance to shopping centers and all schools, 3 children, ok, \$235 mo., 1st. and last plus \$100 clean. Available after Dec. 27, 738-3477.



# the astrogram

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National Aeronautics and Space Administration • Ames Research Center, Moffett Field, California



## Director's Christmas Message 1970

Once again the Christmas season is here and I would like to extend to all of you and your loved ones my best wishes for good health and happiness during the holidays. The past year has been an interesting and, at times, exciting one. It is my hope that through our work in seeking and applying new knowledge we will help in some way to bring and preserve peace and a better life for all people throughout the world.

*Haus Mark*  
Director



## Ames Scientists in UNESCO Program

Dr. Cyril Ponnampertuma, Chief of the Chemical Evolution Branch, is visiting Ceylon during December and January at the invitation of the Director General for Basic Research of UNESCO (United Nations Educational, Scientific and Cultural Organization). He will give a series of lectures on the two campuses of the University of Ceylon at Peradeniya and Colombo.

Included in Dr. Ponnampertuma's lecture tour will be visits to Vidyalankara and Vidyodaya Universities in Colombo. Public lectures will also be given before the Ceylon Chemical Society. The topics will range from the origin of life, chemical evolution, and lunar analysis, to the search for extraterrestrial life.

The initial lecture series will be followed later by a three-week institute on Early Evolution of Life to be held at Peradeniya, Ceylon, under the direction of Dr. Ponnampertuma. The participants will be 25 young scientists selected from the countries of South East Asia - India, Pakistan, Burma, Malaysia, Indonesia, and Ceylon. The international faculty will consist of Professor Daniel Mazia of the University of California, Berkeley; Professor Geoffrey Eglinton, University of Bristol, England; Professor Herrick Baltscheffsky, University of Stockholm, Sweden; Professor V.B. Evstigneiev, Academy of Sciences, USSR and Professor Haruhiko Noda, University of Tokyo. This program is part of an effort on the part of UNESCO to stimulate the growth of basic science in developing countries.

The NASA Office of International Affairs has arranged for an Apollo exhibit to be available during the lecture series through the courtesy of the U.S. Information Service in Colombo, Ceylon.

On his way to Ceylon, Dr. Ponnampertuma visited Stockholm on the invitation of the Nobel Foundation to present a lecture at the Nobel Workshop on the Origin of Life, which was held early this month in connection with the 1970 Nobel awards ceremonies.

## History of Ames

A limited number of a paperback edition of the "History of Ames" by Edwin P. Hartman has been obtained and will be offered for sale to Ames and contractor employees at the Center. Price of the edition is \$4 and may be purchased from "The Astrogram" Office, Room 134, Admin. Mgt. Bldg.

## PIONEER 6 SETS IMPRESSIVE RECORD

# Pioneer Celebrates Fifth Year in Orbit

The Pioneer 6 spacecraft, which at launch in December 1965 had a planned life of six months, is completing its fifth year in solar orbit this month and is "alive and well."

The veteran spacecraft appears to be among the best values in the U.S. space program. Pioneer 6, first of four Pioneers now in solar orbit, might be called almost a complete space project in itself.

The spacecraft is operated by Ames and was built by TRW Systems, Redondo Beach.

During its five year life, Pioneer 6 has been around the Sun six times (compared to the Earth's five times) and has covered 3.3 billion miles.

Relative to the Earth (since both are in solar orbit) it has circled the Sun once. This has enabled it to take man's first look at the unseen side of the Sun. It has provided essential new data for defining the "solar atmosphere" or interplanetary medium. It has pioneered regular "solar weather reports" from the unseen side of the Sun, and helped with understanding of the workings of the solar corona and the Sun itself.

Pioneer 6 has made important contributions to defining the exact orbits and mass of the Moon and planets, and has performed an experiment to check the theory of relativity.

### EARTH'S WEATHER

Pioneer 6 data has been important to man because it helps understand the operation of the Earth's energy source, the Sun. Pioneer 6 data is providing insights into the Earth's weather processes, and the spacecraft's measurements of particles and magnetic fields provide knowledge in basic physics, applying to such things as nuclear power systems. (Interplanetary space can be thought of as a huge cyclotron with the Pioneers making measurements from inside.)

Pioneer 6 data has filled 7300 miles of analog data tapes, recording 35 billion data bits. During its 45,000 hours of flight, NASA's Deep Space Network has taken data from the spacecraft during 9500 hours. Its maximum distance from the Earth on the other side of the Sun has been 180 million miles.

Cost of all spacecraft operations to date, including spacecraft, experiments, launch vehicle and launch and five years of experimenter work, but not tracking network operations, has been about \$20 million, according to Ames' Charles F. Hall, Pioneer Project Manager.

Pioneer 6 is getting a bit middle-aged, after its 3.3 billion miles of flight. It's out of nitrogen gas for maneuvering and the Sun sensors to guide maneuvers no longer work. However, since the Pioneer is firmly stabilized in the plane of the Earth's orbit by its 60 rpm spin, no further orientation maneuvers will be needed.

Performance of one of two radio receivers has degraded, so controllers are using the other one, and solar cells have been damaged somewhat by several massive solar flares, but still provide plenty of power. The magnetometer experiment says it's in good working order when ordered to calibrate itself, but when turned on all it sends back is a string of zeros.

### SPECIAL EXPERIMENTS

The other five experiments, however, are in good order and the spacecraft's long life has allowed the performance of a number of special experiments based on its position in space.

When Pioneer 6 passed behind the Sun in November 1968, it was the first time such a strong, well-defined radio signal from a known madmade source had been sent through the Sun's corona. This allowed unique measurements of the corona.

When Pioneer 6 passed Pioneers 9 and 7, also in solar orbit, it was possible to look at the same solar wind particles and solar cosmic rays with two different spacecraft millions of miles apart. Scientists were able for the first time to trace the precise flow of particles and their interactions with the interplanetary magnetic field. Currently, with Pioneer 8, the best measurements ever made of the distributions of solar wind particles are taking place - again because the long life of Pioneer 6 has lined it up with the Earth and Pioneer 8.

The long-lived spacecraft has not made an orientation maneuver since 1966. This means it acts as a small planet, completely subject to solar system gravity forces. Since its radio signal can be tracked precisely, it serves as an exact reference for planet orbits and masses, and relativity measurements.

Because of this precise location, the manned spaceflight network stations will shortly use Pioneer 6 to locate themselves precisely on Earth.

In defining the solar atmosphere, Pioneer 6 made the first identifications of massive streams of solar cosmic rays flowing through space,

## FPC Scholarship

The Federal Personnel Council of Northern California has announced the establishment of the tenth annual college level scholarship fund. As in the past the scholarships are for children of Federal employees and has been extended to a youth employed under the Youth Opportunity Programs (the President's Stay-in-School Campaign and the Summer Youth Opportunity Campaign.)

Depending on the generosity of sponsors, professional associations and others interested in this deserving project, six or more \$350 awards will be granted. Selections will be announced at a luncheon in May.

To be eligible, the applicant must be a son or daughter of a career civilian employee presently employed in a Federal agency located in Northern California; a son or daughter of a retired or deceased employee who had been employed during the summer of 1970 under the Summer Youth Opportunity Program; and must be a high school senior graduating in January or June 1971.

The \$350 scholarship will be based on scholastic ability (from high school records and results of scholastic aptitude tests of the College Entrance Examination Boards); leadership potential (from an autobiography and letters of endorsement from references and teachers); and a 1200-word essay based on "The Role of Youth in Meeting the Challenge of Today."

Deadline for making application for the scholarship is April 1. Application forms may be obtained by contacting Mrs. Evans or Miss Richardson, Room 134, Admin. Mgt. Bldg. ext. 2385.

the first accurate measurements of the numbers of charged particles in interplanetary space (4-7 electrons per cc); it found filamentary stringers in the interplanetary field, and clarified the sector structure of the Sun's magnetic field. It provided some of the first data on how masses of particles are propagated through space after flares (explosions as big as the Earth on the surface of the Sun.)

Room 134  
Admin. Mgt. Building  
Phone 2385

**The Astrogram**

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# Ames Annual Children's Christmas Party

It was a day for the little people. There were big balloons, cookies, candy canes, Marionette shows, music, presents; and best of all Mr. and Mrs. Santa Claus arrived in a helicopter.

The Annual Ames Children's Christmas Party brought holiday cheer on December 12. The bottom three feet of the big hangar was not to be seen through the wide eyes and excited smiles.

## WINNERS

There were excited smiles on a few of the big people, too. For instance, Don Ciffone, Radiation and Wakes, had a bright sunny smile after learning he had won a trip for two to Hawaii.

Other winners were; Bob Berggren, Hypersonic Free-Flight, the color television; John Viegas, High-Enthalpy Research Branch, a \$25 Savings Bond; Carl D. Kolbe, Research Instrumentation, rod and reel; Harold Clements, Impact Phenomena, Barbeque; Einar P. Ekholm Hypersonic Aerodynamics, a sleeping bag; and Dorothy Rivero, Cafeteria, a golf cart.

It would be extremely difficult to say "thanks" to every person who helped make the party such a success. However, there are a few, without whom, the party would not have taken place. Sal Tardio and Jan Konrath are especially congratulated on a job well-done.

Chairman Sal Tardio wanted to personally thank those who helped;

## "THANK YOU"

"I wish to thank each Chairman and Co-Chairman of the various committees in the gift shops and refreshment areas and also all the Santa's Helpers who were gracious to come in and give their time for the Ames Annual Children's Christmas Party.

It would be impossible to print the names of each individual helper, but we do extend a very hearty "Thank you" to everyone who helped in making the party successful. I would like to add a special thanks to those who worked long and hard getting the party planned and coordinated. These people are: Fred Baker, Co-Chairman, Dorothy Evans, Advisor, Jan Konrath, Coordinator, Jim Connolly, Master of Ceremonies, Carole Starkenburg, Secretary, and our fellow employees who made terrific clowns, tinkerbells and especially Bruce Smith and Darlene Moen who were Mr. and Mrs. Claus. My special compliments and sincere thanks to a guy by the name of John Diaz who did a magnificent job keeping the refreshment areas supplied, and to



Jo Hartke for her great sketches.

I might add, the party was a BIG SUCCESS.

Sincerely, Sal Tardio, Chairman"

Traffic and parking was handled by members of Boy Scout Troop 62, San Jose, under the direction of their troop leader, Bruce Compton and the aid of Eagle Scouts from Troop 480.

Entertainment was provided in the finest tradition, by Ed Kelley and his Marionettes, and by The Family Tree. Mr. Kelley, assisted by Louis Rondoni, kept the children awed with his clever variety of marionettes. Mr. Kelley handmade each of the marionettes, and has been entertaining with them for several years as a hobby.

The Family Tree, a professional group, provided great musical entertainment. Music was also provided, in a more traditional way, by the Ames Choral Group. The group, under the direction of Bill Houck, sang a selection of Christmas favorites.

Although they were not on the stage, the clowns were a source of entertainment with their balloon animals. The artists, Jo Harje, Will Vallotton and Vernon Hartje also provided a unique form of entertainment with their wonderful pictures of animals.

One hundred and eight children from the Kavanaugh School in East Palo Alto were particularly enchanted with the party. They came as guests of Ames and were escorted by sons and daughters of Ames employees. The Kavanaugh children sent a note "dictated" to one of their teachers to Ames after the party. It read; "Dear Santa Claus, Thank you for the party. It was fun. Love, All of Us."

## Humphreys in NASA Life Sciences Post

Management of all NASA life science activities, has been consolidated under a new position of Director of Life Sciences in the Office of Manned Space Flight, NASA Headquarters.

Named to the new post is a medical doctor, Maj. Gen. James W. Humphreys, Jr., USAF (Ret.). His responsibilities include biomedical and bioscience research, associated flight experiment definition, advanced life support and protective systems, man-machine integration, and advanced bioinstrumentation.

He also has overall responsibility for the coordination of related programs which remain with other offices.

## Astronomy Class

Is there a Christmas telescope in your family? If so, plan to attend the Peninsula Astronomical Society Program at Foothill College at 8 p.m., Friday, Jan. 8. An "Introduction to the Heavens" will be presented for the new telescope owner, there will be a space film, and coffee and doughnuts. For information call 948-8354.

## BASKETBALL

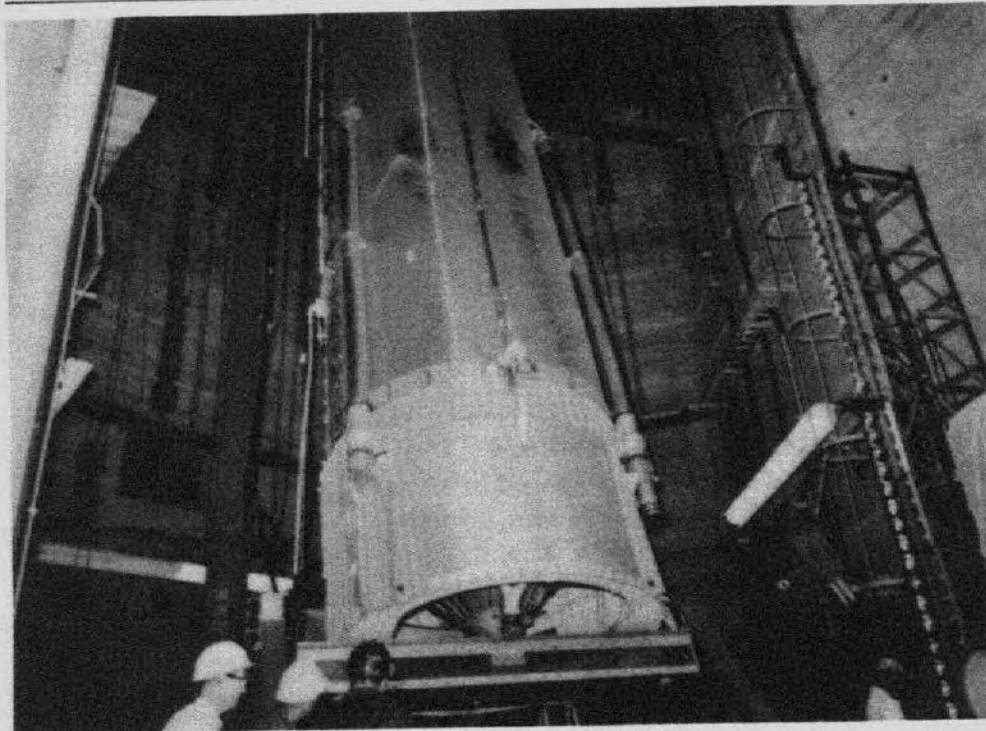
... by Phil Wilcox

The All Ames Basketball league finished the first half of the season on Thursday, December 17. CSC de-

feated ARO by a score of 70-46. This enabled CSC to capture the first half lead with 5 wins and no losses. The final score was, Jets 43 and Madmen, 38. The Fighting Pumas outlasted the Beer Barrels in a close game, score F.P. 37, BB.B., 35.

Team standings are:

TEAM	WON	LOST
CSC	5	0
Beer Barrels	3	2
Jets	3	2
Madmen	2	3
Fighting Pumas	2	3
ARO	0	5



LAUNCH VEHICLE TESTS . . . Installation of this modified Atlas launch vehicle model for testing in the 100-foot vacuum tower at Ames was recently completed by the Structural Dynamics Branch. The tests now underway concern mode alleviation and aerodynamic damping for the space shuttle. A second vehicle, a Titan I, will also be used in the program. The large beams left and above the launch vehicle are part of the suspension system designed by Wayne Hadland, Allan Bakke, and Mladen Chargin of the RFE Branch. The Project Engineer is Jerome Pearson pictured far left.



## Ames Airings

... by Jeanne Richardson

With Christmas almost here, Ames has been alive with a festive spirit. Division Christmas parties have made lunch hours fly by, and bright decorations have cheered offices all over the Center.

The Photographic Technology Branch has a beautiful, six-foot tree in their lobby, decorated so well that it looks as though it belongs at home. And, as a special way of saying Merry Christmas, they have pretty glass jars filled with candy for their "customers."

Speaking of the Photo Tech Branch, photographer Lee Jones is off to Tennessee for a two week visit with granddaughter, Lee, you recall, was the prime photographer for NASA at the Gemini missions and most of the Apollo splashdowns, including Apollo 11. Lee said he didn't know he could still get excited about going on a trip, but he certainly was for this one. He and his wife, Alberta are looking forward to seeing their 10-month-old granddaughter, Ronna Lee. Richard and Kinney, Lee's two sons, will also be making the trip.

Although there were many great Division Christmas parties, RFE takes the "elegant entertainment at Ames" prize. For their party they reserved the cafeteria December 12, engaged Stuart Hill (contractor for the Cafeteria) to do the catering and bartending, and hired the Non-Such Jazz Band for music. The party began at 7 p.m. with cocktails, dinner at eight, and dancing till one. Reports have it that the music was fantastic. DON FROLICH (RFE of course) is a member of the band. JOHN BRODERICK AND TED BROWN (RFE) and their wives, made candles for the party. The candles, with the lights turned low, added just the right romantic touch.

### CONGRATULATIONS

JOE STEINBOCK (Classification) and his wife Martha recieved a very special Christmas present, a little early this year. On Nov. 16 Jane Sophia Steinbock was born. We have no definite report as to the color of eyes or hair, since Joe claims it changes, almost every day. Firstborns are always exceptional children. She weighed 8 lbs. and was 20 inches long. Merry Christmas Joe and Martha.



## Sport and Boat Show

NASA-Ames Day at the San Francisco Sports and Boat Show is Thursday, Jan. 14. Reduced rate coupons valued at \$1 will be available after Dec. 31 in The Astrogram office. The special coupon is to be presented at the Cow Palace Box Office. Admission is \$2 without the coupon.

## JOGGERNEWS

... by Jim Woodruff

At ten o'clock on the windy, wet, and cold morning of November 31, four Joggnauts; Vito D'Alloia, Bruce Castle, Paul Sebesta, and Ted Passeau ran the 26-mile Petaluma Marathon. Vito, Bruce and Paul ran the first half at about a seven-and-a-half minute mile. Vito kept the pace to finish in about three hours and 15 minutes. Fatigue caught up with Bruce and Paul at about 20 miles but they continued and finished about 15 minutes after Vito. Then Ted, running his even pace, finished just the way he planned and Vito turned in the best Joggnaut performance yet.

On April 18 the Joggnauts are sponsoring a race to be called the De Anza Ridge Run. It will be about nine miles long and will start at De Anza College. The race will be sanctioned by the AAU and is on the Pacific Association 1971 Long Distance Running Calendar. We can expect over a hundred participants. Early next year the Joggnauts will have a meeting to plan for this. Anyone interested in helping will be welcome.



VITO D'ALOIA ... (foreground) leads his fellow Joggnauts, PAUL SEBESTA and BRUCE CASTLE in the grueling Petaluma Marathon November 31. Four Joggnauts ran the Marathon; Vito, Bruce, Paul and Ted Passeau. Vito kept a seven-and-a-half minute mile pace throughout the race, with Bruce and Paul finishing 15 minutes behind Vito.

## Don't Be A Victim!

The approach of the holiday season offers a lucrative field of operation for the thief who specializes in ladies' handbags and purses. Most offices at Ames will be unmanned due to annual leave schedules; and some employees will have extra money with them for Christmas shopping.

This is a time to be especially conscious concerning security of personal property. All personnel are cautioned that it is their responsibility to provide for the safekeeping of their money, jewelry, portable radios and the like to avoid these unfortunate disappearances.

Don't have an unhappy Christmas because of carelessness. Be alert, protect your property and have a happy holiday season.

## BOWLING

... by Dennis Riddle

Following fourteen full weeks of league play, Division I is still open with the Huffers in 1st place with 35 1/2 wins. Division II is led by the Eight Balls with 34 1/2 wins, followed by the Crazy Eights with 23 wins.

Yours truly bowled a 210, 220, 169/599 (I'm doomed to ever get a 600 series). Bernie Somer bowled 211/580. Hank Cole, 205/572. Ann Teshima represented the ladies with a very nice 212/541.

Remember, no bowling December 22 or 29. See you at the Moonlite Lanes January 5. Merry Christmas and Happy New Year.

## WANT ADS

The Astrogram's ad section is provided as a personal, non-commercial service to Ames employees. Advertiser must be identified by name, extension and organization. The name may be left out of the ad but is needed for records. Ads must be submitted in writing to The Astrogram, N-241-4, by Thursday, a week before publication. The advertiser's home telephone number must be provided as a point of contact except in carpool notices.

### AUTOMOBILES

For Sale-1963 Corvette, completely rebuilt, best offer or trade, 225-1530.

For Sale-1957 Chev. 4-door, 67,000 miles, good condition, std. trans., r/h, very clean, in and out. \$275, or best offer, must sell soon. 941-1861.

For Sale-1965 Ford Falcon, V-8, w/289 engine, new tires, radio and heater, \$600. Phone, 243-3476, after 5 p.m.

### MISCELLANEOUS

Free-Flowers, I think alot of people, including me, would enjoy having lots of flowers growing around Ames as the spring season approaches, especially secretaries. I also feel there are lots of people, including me, that would enjoy planting them and, if we would show a unified enthusiasm, I think our bosses would encourage us. If you are interested, contact Rudy Posch, ext. 2565, N 213-3.

For Sale-20' outside stair case railing, "wrought iron." Will sell cheap, call Phil Ekholm, ext. 2401 or 253-2890.

Found-Vicinity of building 339, lady's stock pen. Owner contact Mrs. Fisher at Ames No. 961-6743 or room 177, building 239.

For Sale-old issues of IRE and IEEE proceedings and transactions. Call Hank, 243-8963.

Lost-Woodworking vise, vicinity of 3.5 foot equipment building. Reward, G. Mateer, 353-2357. Also, wanted, table saw, 10", tilting arbor. Also other woodworking tools, call 353-2357.

Found- In Ames cafeteria approx. 12/9/70, key chain. Phone Security, ext. 2337, describe it and it's yours.

For Sale-Lido-14 Sailboat, with trailer, like new \$950. 241-8680.

### HOUSING

For Rent-Winterized cottage near Rte. 89 and N. Tahoe ski areas. Sleeps 6 - \$90/wk or \$40/wknd. call 328-4642.

## Ski Trips Offered

As the ski season begins to show promise of being one of the best Californians have seen in a long time, the Ski Club is getting underway with some exciting trips. Below is a schedule of places, and dates for the trips. For details contact the person listed with the trips. You need not be a member of the club to join us on the trips.

December 29, Sugarbowl, one day trip, mid-week prices, Brian Dawson, ext. 3307.

January 9-16, Sun Valley, Idaho, Denise Lucy, ext. 2872.

February 12-15, Squaw Valley, Annual Washington Birthday trip, Bob Stroub, ext. 2442.

March 5-7, Incline Village/Alpine Meadows, bus trip, staying at Stateline, North Shore. Jack Tunnel, ext. 2683.

March 27-28, Mount Rose, 9,700 feet good late season skiing. Ralph Maines, ext. 2151.